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Trouble report decrease at an IT help desk

Nori Montero

ROCHESTER INSTITUTE OF TECHNOLOGY
Department of Hospitality and Service Management
Graduate Studies

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Name: Nori Montero SS# _____ Date: 2/17/04

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Thesis Committee: (1) James W. Jacobs, Ph.D. (Chairperson)

(2) Richard Morales, Ph.D.

OR (3) _____

Faculty Advisor: _____

Number of Credits Approved: 4

12 Feb 2004 — James W. Jacobs, Jr.
Date — Committee Chairperson's Signature

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IT Help Desk Trouble Reporting

Nori Montero

A Project Submitted in partial fulfillment

of the requirement for the degree

Masters of Science on Service Management

January, 2004

To Yoly my daughter, the reason for my existence.

N.M.

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Abstract

The purpose of this project is to help improve the internal customer service for the PRECISE. IT help desk. Specifically, this report will determine the root cause, or causes, of increased trouble reports after the installation of a new Wireless application. We will define the challenges the IT managers faced regarding the ability to embrace best practices for a complex IT environment. By this we will cover problems related to process assessment, mission, training, policy and how other companies are confronting the challenges of a service centered culture and TQM methodologies. This will help in understanding how these managers must meet their internal customers' challenges and the need to use appropriate tools for problem solution, statistical graphs for follow up, and service objective tracking. By identifying these challenges, managers will be able to help their employees modify their assessment practices.

New project management skills will be provided to assure the integration of the project processes, follow up, and impact assessments, testing procedures, and training and supplier negotiations. By providing these skills and knowledge to the managers, they will be in the position to appropriately meet the needs of customers, and succeed in the new era of advanced technology where customer expectations are constantly rising.

Chapter I

Introduction

How could we live without our friends at the help desk? End users everywhere rely on their problem-solving skills and patience - especially when we have mysterious PEBKAS (problem exists between keyboard and seat) errors.

In a business enterprise, a help desk is a place that a user of information technology can call to get help with a problem. In many companies, a help desk is simply one person with a phone number and a more or less organized idea of how to handle the problems that come in. In larger companies, a help desk may consist of a group of experts using software to help track the status of problems and other special software to help analyze problems (for example, the status of a company's telecommunications network).

Typically, the term is used for centralized help to users within an enterprise. A related term is "call center", a place that customers call to place orders, track shipments, get help with products, and so forth.

Some common names for a help desk include: IT Response Center, Customer Support Center, IT Solutions Center, Information Center, and Technical Support Center. Today companies face many challenges managing their IT complex environments. New software application implementation, evolving technology, hardware and software integration, and integrated platforms increases customers' service expectations and brings IT manager new challenges. In dealing with external customers, a lack of engineering support can create frustration.

Often engineering is consumed with developing a new and improved product, rather than supporting the current software and application version. This puts technical support in an

awkward position of supporting a product that might have flaws or bugs, and yet not getting the level of cooperation needed from internal sources.

Overall objectives and responsibilities of a help desk in any modern organization includes the following: Provide high quality customer service and technical support, a single point of contact, trouble tickets to the appropriate departments as needed and ensure rapid, effective resolution for a wide variety of IT problems. Any IT help desk's staff should be highly trained in their technological arena, in addition, they should also be highly customer centered.

While a technical understanding is essential in delivering support to users, also important is the ability to communicate well and empathize with the customer's situation. Thus the technical support representative's level of emotional intelligence is critical to success. Help desk staff also assist with services such as training, documentation, technical writing, programming, and web and system tools development.

Background

Precise is a telecommunication company in the Dominican Republic. Precise has a database of more than 200,000 customers and it is a full service provider for Voice, Data and Video. This company is known as one of the Latin American Companies that propels "world class" technology offering the best for customer service: Backbone, Fiber Optic, Data network, 24-7 automatic monitoring, and top-notch applications such as a new software package to manage "end- to- end" the wireless provisioning process and CRM, both implemented in 2001.

PRECISE as all modern companies, has an internal help desks which is designed to assist internal customers who call to report general problems within system applications, software and hardware. During 2001, a new application to manage end-to-end wireless customer processes was implemented.

This system was put in place with the objective of improving the overall operation to activate cell phones as well as to improve the billing process. Nevertheless, companies that are aware of the impact of technology innovation and what these changes do to their operations must use a structured approach to deal with these sophisticated changes.

In order to avoid negative impact of new application implementation, help desk mission and repair processes should be revised before any deployment of new technology.

Problem Statement

In 2001, PRECISE implemented a new application to manage end-to-end wireless customer processes, with a very complex infrastructure. Due to the complexity of the implementation, all related processes were revised and employees trained, except for the IT help desks technicians.

As a result of this lack of training, end-users had to contact other departments looking for a solution to their system problems. In addition, the new wireless system crashed, trouble reports increased, and response time to system error correction slowed down. This all resulted in poor internal and external wireless customer service.

Statement of Purpose

The purpose of this project is to help improve the internal customer service within the PRECISE IT help desk. Specifically, it will determine the root causes for the increase in trouble reports. Furthermore, the project will recommend action items to obtain management support to embrace a customer-centered culture.

Major Questions

(a) Are technicians using the right tools to solve system problems or errors?

(b) What are the flaws of the current processes?

(c) What are the IT Help Desk training needs?

(d) How are the critical system errors being tracked?

(e) How is this problem affecting the internal customer?

Delimitations

This research will take place at PRECISE, a telecommunication company in the Dominican Republic. The scope of this research will cover the wireless internal customer's process when they report system's problems to the IT Help Desk.

Limitations

A revision of PRECISE' IT Help Desk processes will require the financial support of upper management in order to arrange new training and allocate additional resources. In addition, a barrier to complete this project can be upper management's lack of interest due to the company's monopolistic culture, a barrier to ultimately improving internal customer service.

Methodology

This will be a descriptive research project in which primary data will be utilized to accomplish this study. In addition, brainstorming data results, historical statistics, and root cause analyses made within the company will be used along with literature concerning the topic.

Literature

The literature for this project will consist of books regarding the improvement of a Help Desk customer service, technical management in modern organizations, process innovation, and customer centered cultures. Other interesting topics will be about process management, quality assurance and best practices relating to help desk operations.

Significance

The understanding of the problematic features revision of PRECISE' IT Help Desk processes will improve the performance of the system platform, decrease application errors, and ultimately improve internal customer support and consequently overall external customer service will also be an expected outcome.

One of the ways to learn about different help desk processes and internal customers service is through enriched case studies and literature on how other companies improved their IT help desk.

The next chapter will cover a summary of all findings during the literature review.

Chapter II

Introduction

History shows us that technology development has a critical impact to our society and on how we behave and interact with others elements in our environment.

After reviewing various articles on the importance of improving the IT help desk service only those trouble reports that better defined the problem for this project were selected to be included in this literature review. Books, magazines, articles, the internet, and employee' meeting information were used for this purpose.

2.1 Computer History

Table 2.1 Computer History

Date	*Historical Development*
Before 1911	a) Man started off by counting on his digits to measure month b) The first primitive counting was notches on sticks or marks on wall c) Blaise Pascal invented the key punch addition machine d) Joseph Jacquard invented a mechanical weave fabric loom e) Hernan Hollerith translated the census data into punch cards, and in 1911 built a company that merge with competitors and formed IBM
1945	a) Howard Aiken from Harvard University invented Mark I
1946 to 1960	a) The invention of Elliac I (Electronic Numerical Integrator Computer) d) Remington and IBM improved Elliac I by developing Univac I and the IBM 740 c) The First Help Desk was introduced in 1950
1961 to 1980	a) Age of the transistors and the third generation computing operating 3-5 millions calculations per second. Considered the age of minicomputers. b) Intel and Microsoft were born in 1971.

Source: *Hailey, Shamanistic Tradition (NY, 2002) pp. 1-6*

PCs today are fast and use graphical interfaces. People can control computers that run thousands of complex technological problems following sets of instructions called programs. Companies needed to improve and to deploy help desks units to give support to customers who did not know how to deal with computers.

2.2. Help Desk history

In late 1950's a group of three operators and five assistants, residing in the Math Department of Boston University, provided operational support for the Iliac I (Electronic Numerical Integrator Computer).

ILLIAC I became operational on Labor Day of 1952. It had 2024 words of 40 bits of processing capacity, was 10 feet long, two feet wide, and eight and one half feet high; contained 2,800 vacuum tubes, and weighed five tons. By the early 1960 in addition to the group of operators, consulting and programming groups had been formed including a group designed to give support to the customers, through what was called help desk. They were all part of the Digital Computer Laboratory, which was reorganized as the Department of Computer Science in 1964.

It was in 1980 when computers started to change about and forced companies to keep up with the new technology. This change caused business by having to focus on recruiting more and more people with proven technological ability.

> "According to Civiletti (2001), as industry moved from the mainframe support environment of the 90's to supporting desktops computers, the help desk evolved into phone support using telephone lines connected to a mixture of support technologies including email, problem management, networking tools and the internet. (p. 6)"

It was in 1980 that a variety of minicomputers were introduced by Noah Shipping causing others companies to keep up. They recruited more and more computer people with proven technical ability. But the effects of these changes were too profound as a variety of bases were installed bringing more challenges to the technicians and the users to keep up with the technology.

2.3. Help Desk definition:

> "Bruton (1997), portrayed the help desk as a chaotic place, full of half-disassemble electronic equipment, with technical manuals open and strewn over desk typically occupied by highly specialized "guru" with a penchant for technical detail, a slender sense of humor, and a distinct lack of sartorial elegance. The ignorant user breaks the rarefied atmosphere with mere business problem at the risk of invoking humiliation at the hand of this masters of the black art of computing, (p.5)".

After years of development; the help desk may still look like a scientist laboratory where the disrespect for its users has disappeared. Today users are more sophisticated, they live with spreadsheet packages four hours or more a day, and for that reason they know more about computers than the technical support groups.

In all companies the help desk is considered a cost center. Help desks are back office functions except to the internet help desk which as designed to provide customers with service when they have problems with their internet service.

Companies that are aware of the impact of technology innovation and what these changes can do to their operations have adopted a structured approach to deal with these sophisticated changes. One of the reasons for having a separate support department under the IT umbrella is to

provide a distinct barrier between the computing function and the internal customers in the form of customer service.

2.4. User support definition:

"Stephenson, 2002 and Burton, 1997 defined computer user support as "the process by which technical knowledge is used by specialist to solve computing problems experienced by lay users as the IT environment becomes more complex companies need to turn to technical people to help the users solve business problems, and also they need to turn to world class best practices to improve their processes and environment. (p.3), (p.1)"

2.5. Help Desk

2.5.1. Structure of a help desk

The structure of a help desk as one that entail how it is managed how the employees are broken up categorically, and the technical systems user.

The help desk software should ensure that it is meeting the needs of the structure and the customers. Does it send email automatically to the end users? It is easy for the PC Support team and the servers Support groups to use? Does it offer all the features you need? Is it flexible to change? Other areas to evaluate besides the software are the call scripts that employees are taught to say when interacting with customers.

User support is a specialized function that contributes to retaining employees on behalf of the company's user population, by helping them to acquire computer experience and technical knowledge about IT in a way that the company uses it to deliver knowledge in a focused form to solve specific technical and business problems whether on a reactive and proactive basis. This in done in such a way that the user' productivity can be

enhanced. For all these reason the structure, mission and goals of IT need to be very well defined and synchronized with the vision of the company. Figure II shows a help desk structure. The process identifies the appropriate responsibilities, ensures communication channels are open, and demonstrates the routes of future progress for the more ambitious members of the team.

The reactive (help desk) and proactive (increased publishing knowledge) functions have been structurally split apart. This is to ensure the proactive work gets done, as it is so easy to permit the reactive work to dominate and preclude all else.

> "Bruton (1997) defined the technical functions of a help desk to be interlinked by job rotation, so that the technicians can move between these functions and get regular exposure to each of the three main technical functions, namely answering technical questions (probably over the telephone), solving problems (possibly at the user's desk), and increasing technical knowledge (by writing about it). The library function stands alone and, probably not staffed by technicians at all but by professional administrators and librarians. (pps. 207-210)"

2.5.2 Characteristics of a great Help Desk

The most important characteristics of a help desk, including being customer oriented, are promoting best practices, using "sophisticated technology" and having a good service package that includes the following:

(a) Availability: The excellent help desk is available 24X7 to meet customers' needs.

(b)Approachable: The worse thing for a help desk is to have call volume dropping off due to perceived arrogance that makes the users feel that they are not welcome by having to wait for the help desk to correct their problem .

(c) Flexible: The great help desk is flexible and meets its customers' needs. It is willing to provide extra support any time.

(d) Measurable: The best help desks keeps measurements, knowing what the call volume is, the average time to solve a user's problem, and monitor trends. This is important because managers can identify systems performance and build training when it is necessary.

2.5.3. Employees

When a system, or application, is installed with new technology, managers need to assure that their employees profile (technical &administrative) is revised, and that training is provided to them before the system or application gets to production. As technology changes new knowledge and experience is needed. Managers need to read books and magazines to learn technological trends to be prepared for the future.

To assure that you have the right employees in place you need to gather information by talking to management and employees from IT. The information gathered can be use to provide more training to the help desk employees.

> "Mckee (1996) said that even if you have excellent help desk technicians you need to expand their role to maximize the user contact's perception by having them offer additional intangible services. This is accomplished by assuring that enough training is provided to the employees. (p. 79)"

Help desk training needs to be constant, employees should participate in cross-training, and have free time to prepare for software certifications in Microsoft, Windows, Novels, etc.

These employees also need to have the following key elements for user' contact:

a) Intention: The employee must have the ability to create a relaxed environment for customers, to have a clear understanding of their mission and goals, and fully understand each call they receive.

"First intention then enlightenment" (Confucius, as cited in Mckee, 1996)

b) Relationship: The help desk employees must be well trained to establish rapport with every customer. Customer service is the best place in the world to show the customers that employees are in harmony with them.

c) Discipline: Employees must know how to count their successes and use time wisely with discipline and a positive attitude.

d) Skills: They need to practice listening, acknowledging, making clear statements and asking the right questions.

2.6 Communication

The foundation of all effective service communication lies in a special skill called the SQT (Statement / Question/Technique). It is a systematic way of keeping conversation going in the direction or path the help desk technician desires. The technique utilizes four steps that on the surface, appears simple, but require practice to be mastered.

The power of SQT lies in the systematic way it gives the customer a "feeling of being cared about" and, at the same time allows technician to control their calls. The SQT is also measurable.

The SQT does not eliminate the customers' ideas rather it encourages them to talk about their problem. The heart of SQT is the skills of, listening, acknowledging, making a statement

and asking the right questions. By providing these skills to your employees this can dramatically increase the help desk's ability to communicate effectively and to understand the magnitude of the problem.

"According to Tschohl (2002) employees must be thoroughly trained to implement service strategy keyed the special needs of internal users. Business usually provides technical training when it is needed but most of the timer ignores training employees on the art of service though it is likely to have greater impact on earning customer satisfaction. (pp. 61-62)"

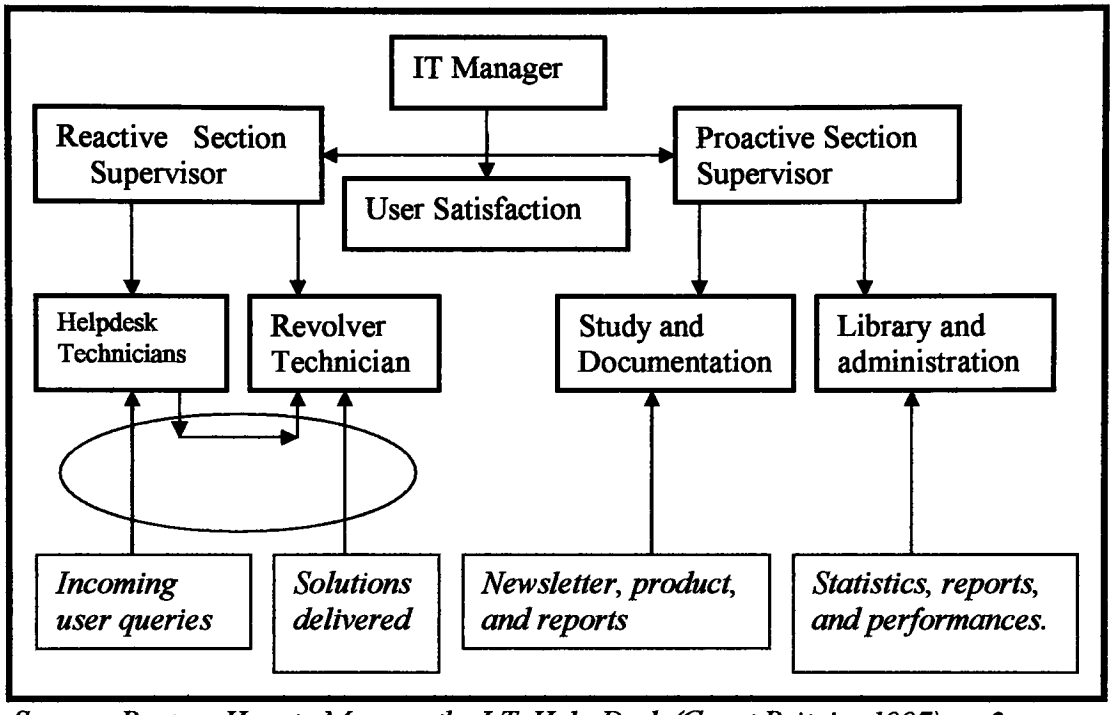
Keeping your staff happy will help with the productivity at a help desk and performance levels. Working at a help desk is oftentimes a stressful experience, burnout is common and employees need to be motivated to keep providing the excellent support a help desk must provide. There are many ways to motivate and reward employees from cash rewards to a pat on the back, which can do wonders.

Root cause analysis must be an integral part of the employees' continuous improvement strategy and a best practice must become a part of this strategy.

"McKenna (2002) said that managers need to motivate employees when they demonstrate root cause analysis skills because this will reduce support cost and increase internal customer's service level. (p.7)"

2.7 The Help Desk Structure

Figure 2.1 Structure



Source: Bruton, How to Manage the I.T. Help Desk (Great Britain, 1997), p. 2

The major responsibilities of a help desk are to receive user inquiries, provide first line support, crisis management, documentation, communication(feed back), and also act as a single point of control, solve problems , and respond quickly to service request.

2.8 Measurements

IT managers must define and negotiate a user service agreement with the customers, before defining what data to collect for measurements. With this information on hand goals can be defined and assigned to help desk managers, supervisor and employees. Without measurements the best that can happen is that circumstances and incidents will control the operations of IT and internal and external customers will be negatively impacted.

"Tschohl, (2002), said that managers fail because they lack the critical ingredient of the customers' requirements and forget to make the relationship between satisfaction, and performance to measure progress. (p. 7)"

Following is a description of the most relevant measurements of a help desk:

a) Service Level: The result of the user perception survey.

b) Call volumes: It is the number of calls received, per a certain period, hour, minute.

c) Average Time per Call: The average amount of time spent on each call.

d) Time to Answer: The amount of time a customer has to hold before reaching a help desk representative.

e) Dropped Calls: The number of calls that hang up before reaching a help desk representative.

f) Time repair: The time from the customer's contact to the help desk repair time of the problem.

2.9 Tools commonly use by a help desk

Implementing the best systems is a key step towards delighting your customers. Having the best software solution in place is part of the solution. Having the right employees to manage it completes the picture.

Without a complete understanding of the tools employees cannot efficiently utilize the functionality of the software and applications that are needed to manage problem solutions:

a) Computer telephone: It is the integration of computer software and telephone systems within the same network architecture that manages incoming and outgoing

calls. Services fill many purposes at the help desk, for example, can the manager's console display the number of calls in queue and service request elevations.

b) Automation software: Applications that help the support employee to quickly prioritize, elevate, track, and resolve service requests either without or in support of other IT technicians.

c) User interface: The tools and techniques the internal and external customer use to communicate to the help desk, such as the telephone, e-mail, fax, direct access, or call management system.

d) Diagnostic aids: Diagnostic tools such as error log interpreters, crash analyzers, or network monitors that assist the help desk employee in rapidly isolating the cause of a customer problem.

e) Asset management: Software that tracks technological equipments and products the company has on site.

f) Call-management system: Software and other systems that work with automatic calls distributors (ACD'), and related technologies to manage, track, and report on call volumes and other call statistics.

g) Electronic software distribution: The capability of remotely uploading software programs or upgrades to customers' workstations. This technology save the help desk or support the unit staff members from leaving their office and making trips to the field.

h) Network monitor: It is the software that analyzes and gives help desk employees an instant picture of the traffic situation on the network and enables them to monitor

network traffic in real time, hunt down, identify, and isolate traffic problems and congestions on the network. It is an excellent tool for preventive maintenance.

2.10 Managing a Customer Service Oriented Help Desk

2.10.1 Service management

"According with Civiletti (2001) today computer users are more technology-savvy. They want the right answers and they want them fast, presenting more of a challenge to the help desk. What is enough training for the help desk employees? Are help desks responding quickly enough? Is the Industry changing faster than the companies, and companies faster than their help desks? "

It has taken blood, sweat and tears to get to where help desks are today, but still there is a need to determine what it's going to take to succeed in the new era of technology advances and with the constant elevation of user's expectations.

It is important to understand and to have in mind that customer service is considered a competitive edge and that today it is simply the "Competitive edge". Intangible service inspires more customers to comeback it is not the product by itself.

Implementing highly professional service strategy is more effective and cost less, than doing marketing, promotion, and product or system development. It is a fact that for those businesses that provides product and service, and it is also true for their back office departments like the IT' help desks that need to provide good service to front office employees who need to work with external customers.

We live in a service-oriented society where quality of service has become more significant to company success than quality of product. Quality service is an effective

tool and a long-term competitive advantage available to an organization in a service economy in which many organizations provide essentially the same service. To compete and win, companies need to be better and better.

"Tschohl (2002) said that in superior internal service has a far reaching effect in business; it can extend to morale, productivity, external customer service, loss on revenues and negative results to the rest of the organization. Those that are willing to give excellent internal customer service exhibit pride.

The customers that receive good service from the help desk are quick to voluntarily assist others within the organization and this chain of good aptitude will positively affect external customer service, (pp. 2, 3)"

The phenomenon of a chain of good service works for every type of business imaginable. Companies that create a collaborative environment have a drastic reduction in employees and external customer service issues. Companies that suffer in internal customer service usually face more challenges.

2.10.2 Quality Management

"According to Lawson (2002) there is no longer any debate about the importance of quality in determining success and organizational longevity. The 1980s taught us this on several levels: nationally, organizationally, and personally a quality renaissance is now underway among manufacturing and service organizations.

(p. Xi)"

During the 1980's many books publications like Search of Excellence by Tom Peters and Bob Waterman shared the successes from selected companies in addressing quality and customer satisfaction.

Other books considered were: Service of America by Ron Zemke and Karl Albrecht, and, Total Quality Control: The Japanese Way by Kaoru Ishikawa that describe what others had done to distil the principles that led to success. They created excitement and enthusiasm. They created a vision of what was possible.

Total quality management is a structured system for satisfying customers and suppliers by integrating the business environment, continuous improvement, and breakthroughs with development, improvement, and maintenance cycles while changing the organizational service culture.

"According to Juran (1997) pinpointing to internal and external requirements allows companies to continuously improve and maintain quality, cost, delivery and morale of the employees. (p. 211)"

Total quality management is a system that integrates all of this activity and information. When all these criteria are implemented correctly, it will structurally and cohesively assure a company a long life.

2.10.3 Process Management

It is important to understand customer satisfaction process because this knowledge is the principal determinants of a company's success or failure, both in the marketplace and organizationally.

Quality initiatives that lack customer input and process improvements that are focused only on internal operations will inevitable result in failure to the company. The first step in gaining control over quality and customer satisfaction in a business is to understand the concept of process. A process is simply a series of events that yield an outcome, coupled with a feedback loop, and then it becomes a continuous process.

"Lawton (1993) talks about the importance of mapping or flowcharting the process which is essential for truly understanding the current status of a problem. Just mapping the "as it" process reveals how much we don't know about it.

The most important purposes of mapping a visual process is to be able to document the "as it" process, to identify ownership, roles, and define the relationship among service and activities. Another important accomplishment is to measure process performance, reduce operational costs, and prioritize improvement opportunities. "(pp. 37-38)"

2.10.4 Best Practices

As business dependence on IT infrastructure increases it is expected to stay ahead of customer service demand using technology and best practices used by world class companies.

Industries are very cautious about investing without good justification in new infrastructure and they are forced to do more with less and that is why they are induced to turn to best practices for help.

> "According to Stephenson and Egozy (2001) IT resources are increasingly becoming important for customer support, this reliance on their infrastructure has created a strain on resources and has forced IT organization to increase quality and productivity while decreasing costs. (P.7)"

To be able to do more with less, companies are turning to industry proven ways to standardize their processes. It is very well known that the success of any IT service manager depends on the successful integration of the relevant processes. The leading standards in best practices are ITIL British Standards, 75000 and ISO 17799 for documentation.

ITIL is a set of best practices proven to be able to do more with less for IT service management. ITIL is designed for five disciplines Incident, problem solution, changes control, application releases and configuration management. It helps IT by integrating processes that are interdependent: System design, service and management, supplier, resolution and control release. It approaches IT principles with a set of standard procedures, which offer a systematic professional approach to management for system provisioning.

ITIL has been evolving since 1989. It began with a set of processes for the government of the United Kingdom and is gaining worldwide acceptance. It consists of two volumes, service support and service delivery both written in 2000 -2001, and interact with network systems, applications and databases for the IT infrastructure as well as the operational management of those entities.

Providing ITIL approaches benefit internal customer service by helping to define service policies, and business objectives. It also provides detailed information for feedback and monitoring service level agreements.

Best practices are the best approach to a situation based on observation from effective organizations in similar business circumstances and its approach is to:

a. Seek ideas and experience from those that have had similar situation before.
b. Determine which of these ideas and practices would be relevant in your circumstances.
c. Try them out-monitor and review work.

2.10.5 Cost vs. Service

How good is your service? Does it really matter? Does it matter how expensive it is? Companies expend substantial resources giving service to employees, the internal customers, but have had less than positive results. Manager's have recognized this cost and are cutting them off from their budget.

This is contributing to decreased internal and external customer satisfaction, because cutting off people and new technology growth is decreasing the level of accessibility to provide good user support, there fore, there is a battle raging between cost control and effective service.

Internal customers of a help desk behave more and more like external customers. In many cases they can shift money in their budget to hire external help desk consultant or internal help desk consultants to solve problems that IT is not solving for them. This situation is causing excessive use of resources to the companies and becomes more critical when a new application is installed and employees do not get the right training or the system is installed with faults.

During the research project TARPS CXA estimated and validated that in the IT help desk environment the cost based on internal customers behaviour when they receive a bad service was very high as shown in Fig. IV. Managers need to start quantifying the cost of service the help desk to improve the overall operation of IT.

Table 2.2 Help Desk Cost

Customer Action Due to Unsatisfactory Experience With New Software	Cost to Organization
1. Waste 10 minutes before calling for help	$10
2. Calls asking for assistance from help desk	$5-10
3. Calls again "shopping the system" for right answer from front line	$10
4. Calls to supervisors to get second level support	$20
5. Demands that technical person be sent onsite	$150-$300
6. Complains to an officer-investigation	$300
7. Customers that do not call waste an hour trying to fix or understand the problem	$60

Source: *TARP'S Research (Internet white paper 1997), page 1*

2.11 Summary

The bottom line is that to be able to grow companies need to implement a customer service strategy, understanding that this implicates the orientation of all resources and all people toward customer satisfaction. Quality is affected when companies make changes without taking in consideration the impact in customer service; we all need to remember that customer bad service is expensive.

Managers need to find a way of measuring help desk costs, improve communication skills, use total quality management tools for problem solution, and need to consider the use of world class best practice for benchmarking and process improvement.

The next chapter will describe the methodology and tools used to collect information for this project.

Chapter III

3.1 Methodology

This project will takes place at PRECISE CXA, a telecommunication company in the Dominican Republic. The population used for this project is composed of employees and managers from four customer service departments, who are responsible for the management of the wireless service. To manage these processes a new software application was in production to be used for providing wireless service to external customers.

The setting and population were selected considering the richness of the information gathered directly from the employees who detected the application's errors, and were directly affected by these problems. These employees were also responsible for calling the IT Help Desk if any problem arose. The participation of representatives from the different work units helped to avoid biases. It also assured reliability of the data collected to analyze the root causes of the problems presented.

Information from different sources was used to gather information for this project consisting of textbooks, internet articles, and magazines regarding the improvement of a Help Desk customer service, technical management in modern organizations, process innovation, and a customer cantered culture.

Total Quality Management (TQM) was selected as a methodology for this project because it helps to integrate the activities and information of a business environment, assuring continuous improvement, while changing the organizational culture to focus on customers. In the

quality management field, there are statistical methods for analyzing numerical data and focusing on results.

We adopted TIP (Total Improvement Process) from the TQM methodology because it helped to focus on the problems step by step. Five steps were selected for this project from the twenty-eight steps available. The richness of the tools for data collection and analysis was also taken in consideration because it helped to work by selecting from the nine sub-steps (tools): 1) Brainstorming, 2)multi-voting, 3)nominal group technique, 4) Flow chart, 5)cause effect diagram, 6) data collection, 7) Pareto chart, 8)scatter diagram, and 9) statistic chart .

The information was gathered by using six of the nine TIP tools; 1) brainstorming, 2)multi-voting, 3)flow chart, 4)cause effect diagram, 5)data collection, and 6)Pareto chart. The consistency of the data was also taken in consideration by collecting information for a period of more than six months.

This project was addressed by using a mix of qualitative and quantitative data and a deductive approach by exploring only one single phenomenon, application trouble reports. We explored application trouble report bounded by time and activities (program, event, process, institution, or social group), by collecting detailed information, and by using a variety of information collection tools from TQM for over six months.

The sample consisted of eleven employees from different levels and departments which had access to the wireless application for more than six months, found errors, and reported to the IT help desk for correction.

The selection of the sample was done by taking into consideration the diversity of the departments to assure spontaneous brain storming sections during the process of information gathering and analysis. The names of the employees who were to participate were selected

randomly (manipulating data from the employees database) to insure each department was represented.

The gathering process began by sending an email to the population of users, which included employees form different levels and departments. The process required no more than twelve volunteers to participate in any set of scheduled meetings. This invitation explained that the main objective was to create a task force focused on decreasing the number of wireless application trouble reports.

Eleven employees voluntarily answered the email approved the calendar, and agreed to be part of the project. The new task force included two employees from the Help Desk one from Customer Billing, two from the Calling Centre, one from Santiago (another city), one from IT System Programming, two from System Management (users) and, one Network specialist.

The methodology was assured by selecting the employees by previously determining job functions, levels, and office locations where employees worked, and by assuring that these employees had full time access to the application. Data flow (high and low pick) of the application was also taken into consideration, allowing the data collection and stratification to be consistent with the sampling unit (trouble report) analysis.

Skills, knowledge and experience were integrated for the purpose of selecting the right tools. In addition, a step-by-step definition was used to train the task force on how to collect information and convert it to data, and to analyze the root cause of problems. The next step was to determine the roles of each member of the group. One example was the assignment of the data collection and statistics generation, which belonged to the help desk supervisor.

3.2 Tools and procedures for data collection

(A) Brainstorming: The project began by conducting a brainstorming section on May, 27, 2003. The leader of the project assured each unit of work that they had an equal chance to participate in order to avoid bias. Brainstorming was used because it was considered the queen of the idea-generation techniques, and by far, the best known as well as the simplest.

The members of the project were encouraged to toss in whatever idea came to them within the limit of ten minutes, on what was causing the wireless application problems to increase. The listing was produced by putting symptoms of the problem in a Microsoft word processing blank document and is shown in Table 3.1 in page 28.

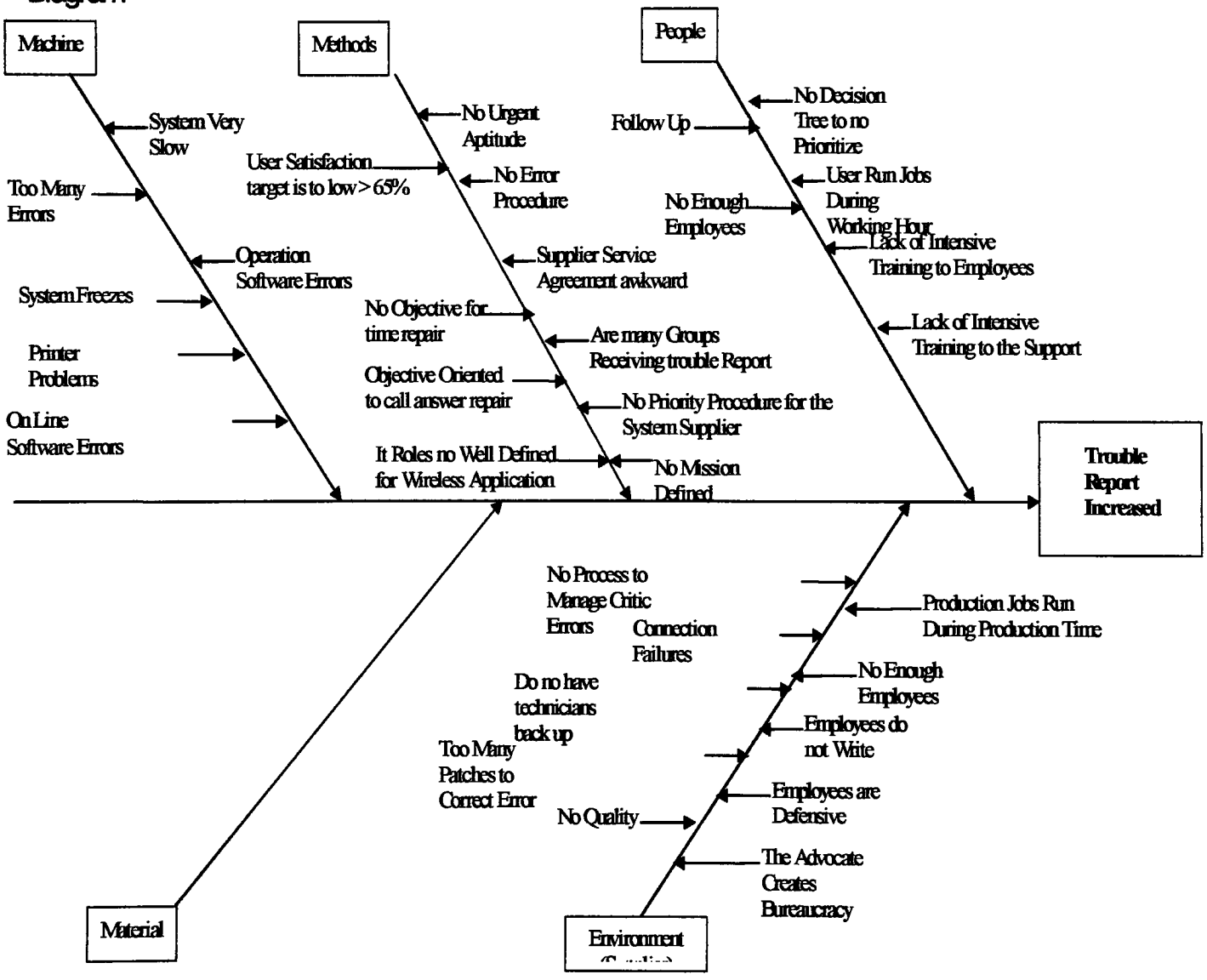
(B) Cause effect diagram: This diagram is called the "fish bone" diagram, and was done during the second brainstorming session on June 9, 2003. The objective was to determine the possible causes of the problem (symptoms). We explained to the task force members that the objective of this exercise was to take the list shown in Figure V (symptoms of problem) possible root causes, and to segregate minor and mayor causes by grouping them around five basic categories: Machine, methods, people, environment, and material.

Table 3.1

Machine	Methods	People	Environment (Supplier)	Material
1. Systems Listing slow	1. No urgent aptitude	1. Follow up	1. No process to manage critical errors	1. No problem
2. System freezes	2. No error procedure	2. No decision tree to prioritize dispatch.	2. Connection failures	
3. Too many errors	3. No objective for time repair	3. Users run jobs during working hours	1. Do no have technicians backup	
4. Printer problems	4. Objective oriented to call answer time	4. Lack of intensive training for employees	4. Too many patches to correct error	
5. Operation software errors	5. Supplier service agreement awkward	5. Lack of intensive training for the support technicians.	5. No quality	
6. "On line" software errors	6. There are many group Receiving trouble reports.	6. No enough employees	6. Production jobs run during production time	
	7. No priority procedures for the system supplier		7. Employees do not write the reports when users call to report problems.	
	8. No mission defined		8. Employees are defensive.	
	9. IT roles not well defined for wireless application		9. No enough employees	
	10. User satisfaction target is too low> 65%		10. The corporation advocate creates bureaucracy	

Initially a diagram was drawn on flipchart paper, and a chalkboard was used to further identify information by category. An overhead projector and a PC with Power point were setup to continue with the analysis; the drawings were saved for further discussion. Figure V Cause effect diagram.

Figure 3.1: Cause/Effect Diagram



The employees were encouraged to strongly think and analyze the factors that contributed to the problem. By pointing out one of the fish bones located in the flipchart and by brainstorming using the five "why" technique we concluded by separating real cause roots of the problem from symptoms. This technique consisted in asking, "Why did it happened?" five times. The last answers were considered the "root causes" of the problem, and these were underlined for further analysis, shown Symptoms list. (See Table 3.1 in page number 28). A wrap-up exercise was done to ask participants to provide feedback on how they felt the objective was accomplished.

C) Multi-voting: The "root cause" listed as a result of the cause effect diagram (Found in figure V) was used to measure the degree of impact of each variable had on the performance of the application. This was done using a multi-voting technique by selecting a ranking tool that helped the task force members to assign a risk criteria to each root cause: a) critic= 5, b) bad=4, c)medium=3, d)regular=2, and e)no impact=1.

The third and last brain brainstorming exercise was done on June, 12, 2003. Each member had the opportunity to participate by assigning a risk criteria number to the information gathered from the root cause analysis exercise. This data was compiled, manipulated, and organized from major to minor impact using Excel software (See Table 3.2)

Table 3.2

Problem Ranking List

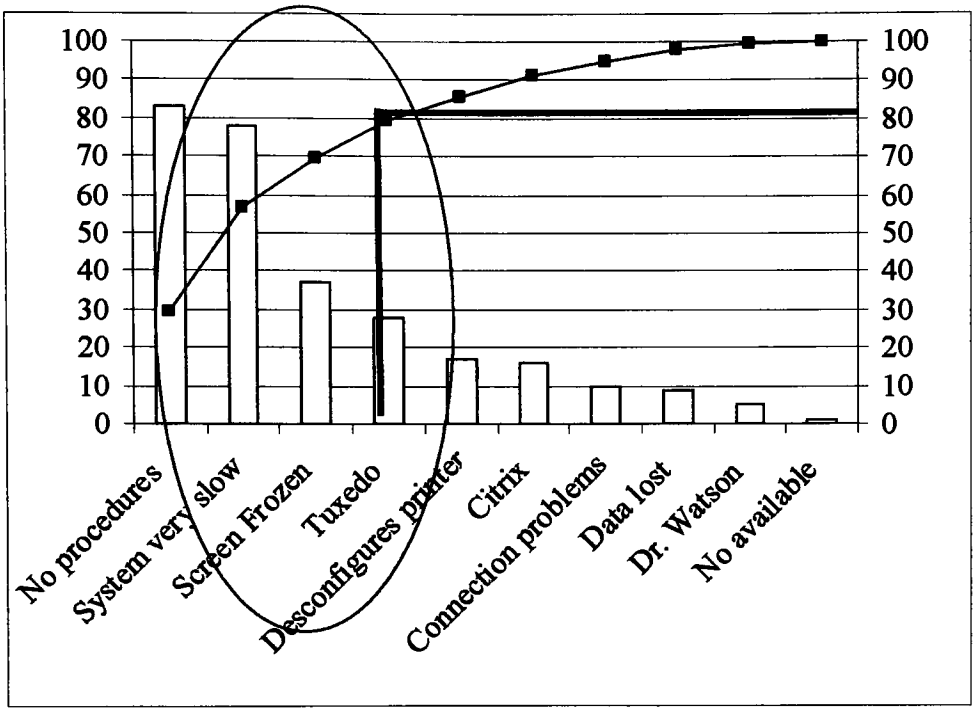
Rank	Problem	Quantity	Percentage
1	No procedures	83	29.2
2	System very slow	78	56.7

3	Screen Frozen	37	69.7
4	Tuxedo	28	79.6
5	Des configured	17	85.6
6	Citrix	16	91.2
7	Connection problems	10	94.7
8	Data lost	9	97.9
9	Dr. Watson	5	99.6
10	No available	1	100

We used a median formula selecting problems from the middle number (fifty) up to the beginning of the list to segregate the root causes that had the higher impact to the application performance. (D) Pareto graph: The work force members needed to work smart to accomplish more with less. They continued with the analysis process by selecting the Pareto chart as a new tool, shown in Figure 3.2 by utilizing raw data from the prioritized ranking list shown in table 3.2 on page 31. Pozo 1996, describes Pareto as:

a segregation statistical procedure which helps to separate "vital factors" (little with high impact) from "trivial factors" (many with less impact) a first group causing (80%) of the problems, "Critical point" and those considered main focus. And, a second group that causes only 20% of the problems.

Figure 3.2 Pareto Diagram Platform Problems



The results of the Pareto were analyzed and two important decisions were made: one to assess the wireless's application trouble report process, and second to request the assignment of human resources to focus on "trouble shooting" the application of critical errors (all related to utility software) affecting the application performance. It was decided not to focus on application error in this pilot because another group was dedicating time to this effort.

Problems related to the functional application were not taken in consideration for the pilot project. The facts collected at this point demonstrated that by working on developing a new

process and fixing the problems related to the application platform would eventually decrease a least 50% of the troubles within a three month target.

(E) Process assessment: The pilot project task force met and defined its goals (time, level of detail, dimension) selected the preferred construct area, and determined the output information to collect for statistical purposes.

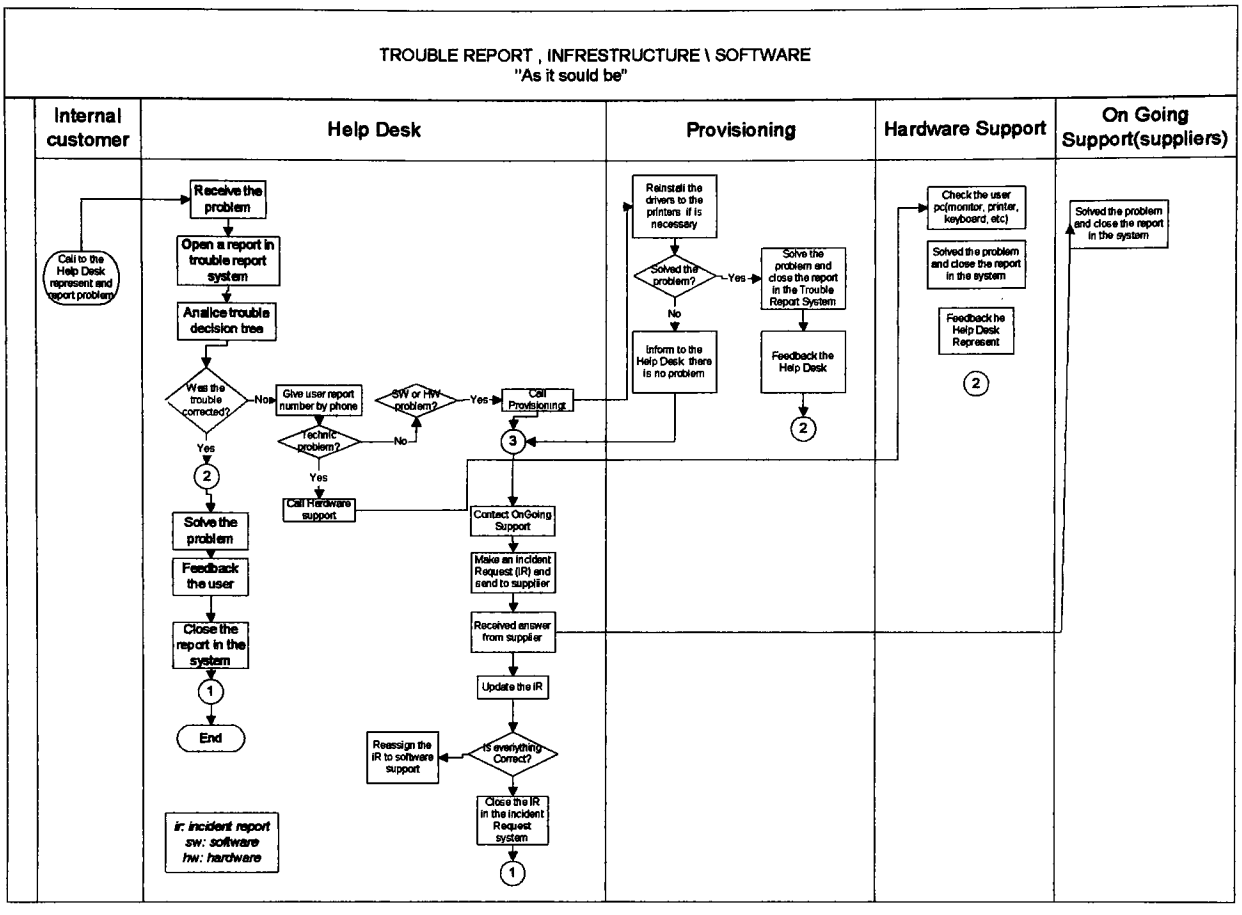
This assessment was initiated by capturing information from four different media; 1) written procedures (including flowcharts); 2) employee interviews 3) analysis of the information flow through the involved units of work, Customer Billing, Service Office, IT Help Desk, Calling Center, Network, and System Administration.

The effectiveness of the control of design, the operation of controls, and the efficiency with which information moved through the help desk were taken into consideration in addressing this assessment.

We started by mapping the "as it is" process and very soon got discouraged by the fact that it was very complex and impossible to draw. Customers were calling to four different work units, and there was not way we could follow up on a trouble report from beginning to end without loosing credibility of the captured information.

There were many steps, sub-steps, and reports sent from one unit to the other. Most of these problems reports were not getting to the correct technician. Sometimes the problem needed to be forwarded to the applications supplier, who never received the trouble reports. We concluded by not mapping the process and to research for a "good pattern" process, and selecting a new standardized, best practice proven to work before, shown in Figure 3.3 As it should be process.

Figure 3.3.As it should be processed



Gin Peter (1998) demonstrated dominant modes of process analyses such as (a) the research for "good patterns" by comparing results with patterns predicted from theory of the literature; (b) "explanation building," in which the researcher looks for causal links and/or explores plausible or rival explanations and attempts to build an explanation about the case; and (c) "time series analysis," Creswell (p. 156).

Should a group attempt to control their environment and systems from day one, or should they stand back for fear of alienating the newly acquired application? Or is there a compromise? Some companies implement new software and before putting it into production they fail to revise their processes. This situation impacts the internal customers, and in the end affects the overall customer service.

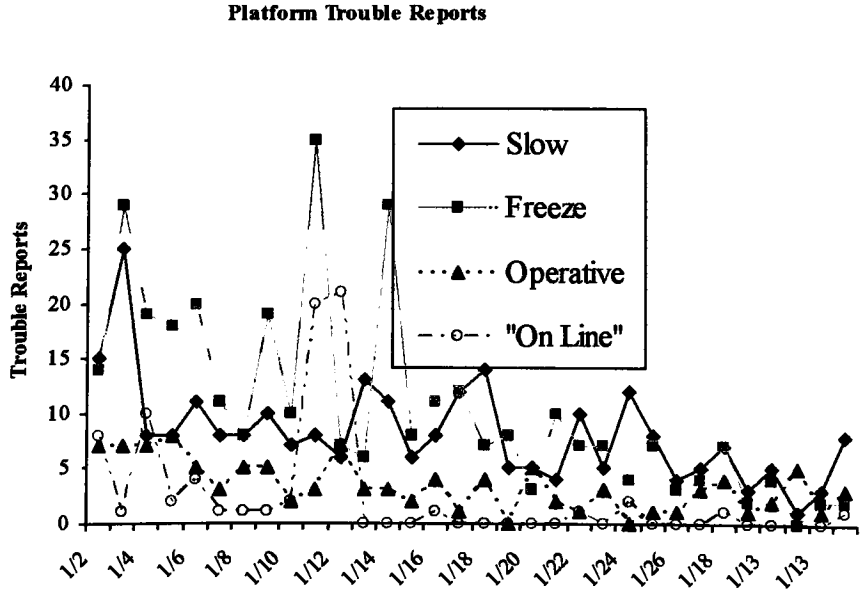
A management presentation was prepared by using PowerPoint software. The objective was to provide status and present accomplishments of the project. We also wanted to focus on getting the approval for the implementation of the new process, obtain additional resources for the Help Desk and more technicians to support the pilot project.

The pilot was approved and the meeting schedule was revised to add more hours, which facilitated time for working together.

(F) Statistical graph: The system that supported the help desk operations contained a module with a database located in the help desk server. This controlled the amount of trouble reports received by minute, hour, day and week.

The supervisor responsible of collecting the data for the task force manipulated the data and using SQL (Structured Query Language) created a file which was loaded in another computer. The supervisor used Lotus software to create the critical trouble reports statistics graph founded in Figure 3.4. This was used by the project leader for meetings related to the status of the implementation of the new process, shown in table 3.2 (See page number 31).

Figure 3.4 Statistical Report



The lineal graph was used because it is good for descriptive procedure, and at the same time implies a story by arranging the data so it seems to change systematically from time to time. For this graph four independent lines were used to represent the different types of problems; System is slow, system freezes, "on line" operative software. This graph was arranged with lines, at the left, detailing top to bottom the elements (types of application problem), that are causing trouble reports; "on line" software, operative software, system freeze, and system response time is very slow.

The next chapter will demonstrate and document the project analysis, results, findings, and recommend.

Chapter IV

This project examined and identified facts that were affecting PRECISE CXA, where the help desk and other departments were receiving an increased number of application trouble reports. Discovered facts will be demonstrated by reviewing the results of the analysis of the collected information.

This chapter is presenting instruments, tools, lecture research, employee discussions and conclusions analysis. The information collection took place from January to September of 2003. Three brainstorming sessions were conducted to assure the validity of the information, and to review the logical thoughts from the employees' knowledge and experience. The dates of these brainstorming sessions were; May 27, June 9, and June 12 of 2003.

2003. Three brainstorming sessions were conducted to assure the validity of the information, and to review the logical thoughts from the employees' knowledge and experience. The dates of these brainstorming sessions were; May 27, June 9, and June 12 of 2003.

The employees were highly motivated to work as a team to have the capability to reduce the number of application trouble reports. It was a unanimous decision to begin working on a pilot project right away in order to start the improvement process. Fast improvement would also contribute to providing the validity to the "assumed" two major root causes identified during the first brainstorming section done on May 27, 2003.

The problems to be addressed during this pilot were; 1) process assessment and 2) application problems related to the performance of the platform. This chapter is also presenting these findings in Figures VII on page 10. As It Should Be Process. Figure IX Statistic Report, also in Figure X, Statistical summary.

4.1 Analysis

(A) Table 3.1 in page number 28. Symptoms of the problem

This figure is a collection of thirty-two perceived symptoms collected from the employees during the May 27 brainstorming session. We concluded by grouping these symptoms by category and counting how many we had, Machine six, Methods ten, people six, environment (supplier) ten and finally material zero symptom. We continued the session by using percentage formula which helped us to find out what type of problems we had to separate them by "soft" and "hard" and to continue with the analysis.

A total of thirty two symptoms were divided into the following percentages; 1) nineteen percent machine (hardware & software), 2) thirty one percent, lack of procedures, 3) nineteen percent related to people issues, thirty one percent due to problems with the supplier

and 0 percent to lack of material. Further analysis is presented in Figure 3.1 in page number 30, Cause Effect Diagram.

(B) Figure 3.1. Cause Effect Diagram (See page number 30)

We planned our second meeting for additional brainstorming for June 9, 2003. The objective of this meeting was to analyze the root cause of the problem. We began the exercise by going through the information presented in Table 3.1, Symptoms list on page number 28. Major causes were segregated in the "fish bone", Figure 3.1 Cause effect diagram, by completing the five "why" technique described in chapter III, page four.

The diagram shows problems underlined in Table 3.1, Symptoms list in page 28, separating the real problems from the rest of the symptoms. By focusing in on the cause effect diagram in the category Machine; bones one and two (system is very slow and it freezes) we found that the root causes were a) lack of computer capacity and user certification to access the data base of the application. We also fount out that a least one dozen of the application "scripts" (template that define the logic flow of a process within a system) were affecting the performance, evidently these problems were not reported formally to the supplier.

Bone three (lack of testing before implementation of the application) was determined to be a cause of the problems as information captured by the employees and confirmed by analyzing applications trouble report statistics. This report presented more than one hundred application errors, waiting to be fix by the supplier that designed the application (not presented in this report because another team was working with application problems and we did not get approval to provide that information).

Bones five and six, operation and "on line" software, had many errors. They were caused by the lack of training by the technicians. This information was also gathered in category number four, described as "Lack of intensive training to the employees".

The category methods presented two root causes; a) Supplier service agreement was not discussed with managers before the implementation of the application, b) Three work units were receiving reports that lacked standardized procedures.

The category Environment (suppliers) demonstrated; a) no test environment, to test application before putting fixes in production, b) lack of technician to work with the trouble reports back log. We concluded by saying that symptoms or root causes were not fount in the category material.

(C) Figure 3.2 Pareto diagram in page number 32

This diagram displays a relative amount of problems of one hundred times on left and right axis. Bars drawn in decreasing magnitude present the frequency; the curve is separating the set of problems that need to be solved first (80%), from the set of trivial problems that can be fixed later in the project (20%). This diagram demonstrates that problems that required more attention were: No procedures, system very slow, screens freezes, and "On line software errors".

The employees felt motivated to include in the pilot project the Operative software issue. This graph shows the trivial problems on the right side, after the dark line in the area composed of disconnected printers, connection problems, data loss, unknown error, and applications that are not available.

The most critical problem was not having the application available, but after a team discussion and reading some technical literature we confronted the fact that the root cause was the "on line" and operative software errors.

These segregated vital problems were then assigned to the technician for further correction. Follow up on the results are shown in Figure 3.4 and Statistic Report and Figure 4.1 Statistic Summary.

Table 4.1

Statistic Summary

Variable	**Bad Pattern**	**Good Pattern**	**Difference**
System slow	14	3	-11
System freeze	37	4	-33
Operative software	7	1	-6
Online software	22	0	-22
Total	**80**	**8**	-72
% of improvement			
*Objective : 50 %			

**Bad pattern is the average of trouble report received in a week.*
**Good pattern is the average of trouble report received after the pilot project began.*
**80 /72% =90% improvement. This represents 50% above objective.*
**80 divided by 72% is 90% improvement. This represent 40%above objective*

(D) Table 3.1 Ranking List Problem root causes in page 28

The ranking list was done by utilizing the root problem cause from the Figure 3.1 Cause effect diagram on page number 30, and from the multi-voting brainstorming meeting where team member's assigned risk criteria to the problems and also used a median formula to

select fifty percent of the problems to be worked on during the pilot project. This procedure is described in chapter III, page five, and the results from the listing done to determine which problems had more impact to the application performance:

1. No procedures
2. "On line" software errors
3. System very slow
4. System freezes
5. Too many application errors
6. Printer problems
7. Many groups receiving trouble report ------- *Median*
8. Operation software errors
9. Lack of training to employees
10. Supplier service agreement awkward
11. Do not have back up technician
12. The Supplier service agreement awkward
13. User satisfaction target is too low
14. The advocate create bureaucracy

(E) Figure 3.2. As It Should Be Process in page number 31

We selected a proven standardized ISO 9000 (standard of PRECISE CXA) procedure as shown in Table 3.2. The described workflow demonstrates one input center, a help desk with a normal flow. We observed that the help desk employees had a positive attitude when the new process was presented to them; this we knew was going to help make this implementation work.

As we revised the process flow we noticed the following attributes; there was enough control the input and outputs, no gaps, no task duplications, no stopping, no trouble report rebounds, and activities were carried out correctly. By using this new process the help desk now makes decision, follows up and gives feed back to the customers about the status of their trouble report.

(F) Statistical Report on figure 3.4 in page 36

This figure is presented in lines implying the story of the project by arranging the data March to September 2003. It describes four independent variables in lines, which were affecting the performance of the application platform: System slow, system freezes, errors in the operative and the "on line" and operative software.

The left axis represents the trouble report frequency in quantity. Our project had duration of thirty-two consecutive weeks. We should bear in mind that problems existed which were caused by a lack of focus on finding solutions and thus the problems continued to grow.

The new process was implemented and as troubles were reported through one channel we began to notice the difference. This is shown in week fourteen of the graph. Technicians received software maintenance training during week fourteen, and began working with the correction of errors during the fifteen-week. This fact demonstrated that the variable, which improves the quantity of trouble reports, was the control performed by the implementation of the trouble reception process.

Software reports were fixed and controlled, processor capacity was added to the computers and yet there were more than ten pending troubles related to the application that continued to affect the time response of the application.

We summarized the trouble report data by comparing "good pattern" results with bad pattern results against our predicted objective of decreasing trouble reports by fifty percent.

(G) The table 4.1 Statistic Summary demonstrates the result of ninety percent improvement, forty percent over the planned objective.

Lack of Change Control process affected the smooth implementation of this project. This is clearly shown in the graphic on weeks eighteen, twenty-two, twenty six and thirty-one. The fact is that the platform was affected by application changes that were done without testing and without impact assessment. This impacted negatively on the expected trouble decrease.

Chapter V

5.1 Findings

From this project we concluded that the following eight findings were the most significant:

1. Technicians were using the correct tools, which is supported in chapter IV, page two paragraph II, where it describes that zero percent of the Symptoms were related to lack of material, this is further supported by Table 4.1 on page 4, Symptoms listing and Figure 3.1 Cause Effect Diagram in page number 30.

2. In terms of procedures, we found that once the new application was implemented the processes used by customer operations was revised and implemented with the exception of the trouble reports management. The process that the help desk and customers were using had many flaws. Customers were reporting problems to three different departments, no statistics to control outputs were kept, too many blank spaces appeared in the reports, and too many trouble reports

were been rejected. This finding was considered as the most critical factor in need of work and yet it had been identified as a "quick fix".

A new process was implemented and as troubles were been reported through one channel (help desk trouble report unit), we began to notice the difference. This can be seen in week fourteen of the Statistical Report, Figure 3.4. Lack of procedures is also shown in the following diagrams: Figure 3.1 in page number 30, Pareto diagram, chapter IV, page 40, paragraphs C, and Table 3.2 in page 30, Ranking which demonstrates that no procedures represented 83% of the problems as perceived by the employees, (page 42, chapter IV, paragraph D).

Finally, Table, 4.1 page 41, Statistical Summary demonstrates that by implementing a new process trouble reports began to decrease. Our planned target for the pilot project was to decrease trouble report by forty percent and by implementing the process and correcting software problems we accomplished ninety percent of our goal. This meant that we were fifty percent over the target.

3. Analysis and consistency of the results showed that one root cause of the problem was lack of IT technicians training in the new-implemented software. Because of this, the technicians could not correct errors and a "back log" was created, (Figure 3.4, Statistical Report). Needed training was identified in the following areas: Citrix (operative software), Tuxedo (On line software), SQL, application database and workflow (Table 3.1 in page 28 Symptom Listing and V Cause Effect Diagram, in the category People. The resulting analysis is in chapter IV, page three, paragraph two, bones five and six, operation, and "on line" software errors. These were caused by a lack of trained technicians.

The most critical problem was not having the wireless application available, however after a team discussion and reading some technical literature, we confronted the fact that the root

cause was the "on line" and errors in the operative software. Help desk training needs to be constant, employees should participate in cross-training, and should have free time to prepare for software certification in areas such as Microsoft, Windows, Novels, etc.

4. Many frustrations were experienced within the task force in trying to find platform trouble report data, analysis, and project follow up. A lot of productivity was lost as we were unable to print customers' bills in many of the service offices and we lost track of the dates when the problems were reported. In order to start measuring received problems we created a manual process beginning in January 2003 (Figure 3.4, Statistical Report in page 36). The application was put into production in September 2001 after loosing sixteen months of platform trouble reports. It was hard to analyze the history of the problem without a measurement it is also hard to get a profound understanding of the result of the quality when errors report is manipulated using different tools (SQL, Lotus, and Power point). The application that provided support to the help desk operations did not provide automatic statistics. This situation caused many immeasurable problems for the customers. One of the weaknesses of this project was the lack of time and resources to survey the customers to assist in completing this part of the project.

5. There was a lack of computer capacity and user software certification (Tuxedo and Citrix) necessary to access the database of the application. By acquiring additional capacity, it helped the trouble report backlog to decrease. The call volume coming into the help desk was extremely high and the employees were instructed to explain the problem to the customer and to not write the trouble report into the system. We just knew by talking to the employees that the call volume had decreased considerably but we did not know how much.

6. At least a dozen of the application "scripts" (templates that defines the logic flow of a process within a system) was affecting the application's performance. Evidently, these problems

were not reported formally to the supplier on time, therefore, further follow up was recommended. It was the root cause behind many of the "system freezes" which was what the customers were confronting.

7. Lack of Change Control process was evident; each time a software code change was put into production it affected the smooth implementation of this project. We also gathered that it affected the smooth operation of the company. This can be seen in Figure 3.4 Statistical Report on page 36 for weeks eighteen, twenty-two, twenty-six, and thirty-one.

8. The employees demonstrated excellent teamwork capacity. They were highly motivated to work together and to acquire the capability to correct the problems and reduce the number of application trouble reports. It was a unanimous decision to begin working on a pilot project right away in order to start improving the process. The employees felt motivated to include in the pilot project the operative software issues voluntarily.

5.2 Recommendations

1. IT managers using ISO 9000 to standardize processes should turn to best practices because the environment has become complex and when this happens companies need to turn to technical people to help users solve business problems. They also need to turn to world class best practices to improve their processes and environment. Implementing best practice utilizing the ITIL approach will benefit internal customer service by helping to define service policies and business objectives. It will provide detailed information for feedback and monitoring service level agreements. It will also, based on observations from effective organizations be the best approach to problems, to seeking ideas and have experienced from those that had similar situations before, and to determined which of these ideas and practices will be the most relevant in their circumstances.

It will help managers do more with less and will give them the capability to implement the following five disciplines: incident, problem solutions, changes control, application, and configuration. It will help IT to integrate processes that are interdependent such as system design, service and management, supplier, resolution and control release (page fifteen, chapter II).

2. Furthermore, we recommend future action to obtain top management support to embrace a customer-centered culture (see a demonstration of this statement in chapter II, and page eight). According to Tschohl (2002):

> ...employees must be thoroughly trained to implement service strategy keyed to special needs of internal users. Business usually provides technical training when it is needed but most of the time ignore training employees on the art of service though it is likely to have greater impact on earning customer satisfaction"

3. It was recommended by the project team that IT managers continue focusing on the approach to TQM because this will be a great help when trying to implement customer improvement processes. Root causes analysis will be an integral part of employee continuous improvement strategies and breakthroughs with development, improvement, and maintenance cycles while changing the employee' service culture. (Chapter II page fourteen).

4. Managers should communicate their mission to their employees and supervisors of the help desk (Table 3.1, page 28, Symptoms Listing, category methods, number eight). Their knowledge of the mission will help the employees to understand their contribution to the objectives of the company and what is expected of them.

5. We recommend the evaluation of modern software, implementing the best systems as a key step towards customer satisfaction. Having the best software solution in place will help

support employee to quickly prioritize, evaluate, track, and have "on line" statistics. It will also help better communication with customers, and resolve service requests either with or without support of other IT technicians. (Chapter, II page seven).

6. We recommend that when a system or application is installed with new technology managers need to assure that their employees' profile (technical &administrative) is revised, and that training is provided for them before the application is implemented. As technology changes new knowledge and experience are required. Managers need updated textbooks and journals in order to stay abreast of the technological changes and thus be prepared for the future (Chapter II and seven).

Mckee (1996) stated that:

...even if you have excellent help desk technicians you need to expand their role to maximize the user contact perception by having them offer additional intangible services. This is accomplished by assuring that enough training is provided to the employees. (p. 79).

7. IT managers must define and negotiate a new user service agreement with the customers before defining what data to collect for measurements. With this information in hand, service goals will be defined and assigned to the employees. Implementing new methods for gathering statistics will help managers improve their operations, avoid unplanned circumstances and assist in taking control of many problems. (A good recommended example would be to start measuring the 'meantime to repair trouble reports, we considered to be very important to be able to measure customer satisfaction. During the project we detected that IT help desk does measure how it take corrects a problem (see literature in page nine chapters II, and also Symptom list, Table 3.1 in page 28, category methods, symptoms number three.

Tschohl, (2002), said: "...managers fail because they lack the critical ingredient of the customers' requirements and forget to make the relationship between satisfaction and performance to measure progress". (p. 7). Managers also need to implement measurements like the one shown on Chapter II, Fig. IV Help Desk Cost on page sixteen. This will help in estimating the cost of their operations based on their customers' reaction when they receive bad service. They will also be able to measure the impact in their productivity.

8. As a final recommendation we suggest the assignment of a project manager who will follow up this project as a means of assisting IT to take this wireless application to the same standards as the rest of the program that are providing support to the front line employees who work face-to-face with customers.

5.3 Limitations

1. We felt bias was being expressed towards solving the technical issue rather than addressing the problems of customer-service satisfaction. This brings doubt as whether or not the root causes of the problem was well analyzed. Further investigation will be left to management.

2. Furthermore, the project will recommend action items to obtain management's support in developing a more customer-centered culture as the next project.

3. We did not survey IT customers to obtain their expectations of service or to understand how the situation was affecting them. We felt we were speculating when we said that the objective to understand the level of customer service was too low. A future investigation will help managers address the cultural changes to service provision and at the same time become cost effective.

After completing the pilot project, we revised all the data gathered by the team and focused on Table 3.2 page number 30, Ranking List, Problem Root Causes. Analysis of this process is shown on pages four and five of Chapter IV. This Ranking identified the result of the multi-voting brainstorming sessions and separated the critical and non-critical problems with the use of a medium statistical formula.

During the brainstorming exercise we revised the listing, and agreed on the fact that early on in the project important problems relating to customer satisfaction were not considered critical and as we perceived it added value to customer service. Example are shown in Symptom list, Table 3.1 in page 28, category methods : a) employees had no urgent aptitude, b) no objective on trouble repair time, C) the objective was oriented to call answer time, d) No departmental mission was defined, and e) IT 's roles for managing the wireless application operations were not defined. We found that the objective for customer satisfaction was targeted too low, as a 65% level of satisfaction was acceptable. An inspiring customer satisfaction objective should be no less than 100%. These factors suggesting that there is an opportunity to reexamine the IT customer service policy and to bring about cultural changes? We would like to leave this statement opened for further analysis and investigation. Other considerations to what that could define the bottom line of this problem could be such things as a lack of project management, budget cuts, and the manager's present policies.

The most relevant finding was the lack of a roadmap defining the interrelationship between the company and the supplier environment. This roadmap would have helped the application project managers in making an impact assessment before the installation of the application. Thirty-two symptoms were analyzed during the project and twenty (or 62 ½ %) were related to

processes and standardization while twelve (or 37 1/2 %) were related to technical/or other problems. (Symptoms Listing Shown in Table 3.1 in page 28).

Best practice is the best-identified approach to a situation like the one confronting PRECISE CXA that centered on their internal customers. Best practice will help IT to integrates five processes: (1) Service design and IT management, to deal with the shape of IT service Management, and impact strongly upon the quality and quantity of services delivered (2) Supplier, this process will help IT to define the correct relationship with the supplier, and at the same time will ensure that the expectations are realistic and deliverable (3) Resolution, will provide tools for recording incidents and resolving problems (4) Control, will close gaps related to what IT has, Where it is. What it does it do, deliver quality, and (5) Release Nothing remain the same and this process will help to manage changes to hardware, software etc.

As business dependence on an IT infrastructure increases, IT is expected to stay ahead of service demands in order to assure customer retention and the capture of new customers. IT resources are increasingly becoming the delivery and support mechanisms behind corporate initiatives that are viewed as the key enablers to overall business goals.

Terms and Definitions

1. Help Desk

A calling work unit where computer "end users" call to report problems. Consist of a group of experts on information Technology using special software to help track, analyze and correct the status of trouble reports in software and hardware.

2. IT

The Information Technology (IT) department manages the technology and computer infrastructure that drives an organization's business systems.

3. Software

Is a logical framework (LF) that provides a means to define or present logic. It is based on a general treatment of syntax, rules and proofs by means of a typed –calculus. There are four categories;

application, database, operating systems, and programming.

4. Hardware

Major items of equipment or their components used for a particular purpose on a computer with all the physical components.

5. Systems Applications

Is a software program that gives a computer instruction and provides the user with tools to accomplish or complete a task?

6. Wireless

Wireless is a term used to describe telecommunications in which electromagnetic airwaves (rather than some form of wire) carry the signal over part of the entire communication's path, for telecommunications network services, such as cellular telephone or paging services.

7. Internal Customers

Employees, that use computer to do their work.

8. User support

A group of specialists that help solve computing problems within the organization.

9. Emotional Intelligence

Is a person's ability to understand his or her own emotions and the emotions of others and to act appropriately based on these understandings.

10. End users

The person who use a computer applications. The end-user may or may not know anything about computers, how they work, or what to do if something goes wrong.

11. Business Enterprise

The activity of providing service, products involving all industrial like computers is now been widely used in business.

12. Telecommunication network

When referring to information technology, a network is a series of points or nodes interconnected by communication paths. Networks can interconnect with other networks and contain sub networks.

13. World Wide Web

The World Wide Web is the universe of network accessible information, an Embodiment of human knowledge

14. Back bone

Is a line or set of lines that local area networks connect to an wide connection.

15. Fiber Optical

Refers to the medium and the technology associated with the transmission of information in the form of light impulses along a glass or plastic wire or fiber.

16. CRM

Customer managed relationship in which a business uses methodology, software, and perhaps internet capability to encourage the customer to control their needs. It is also used to empower the employees with the information needed for personalize service.

17. Automatic monitoring:

It is software that logs all keystrokes, applications, windows, websites, internet connections, passwords and chat conversations. It is use to detect report faults for preventive maintenance.

18. Infrastructure

It is the physical hardware used to interconnect computers and users.

19. Customer centered culture

It is a well defined company strategy that focuses on satisfying customers.

20. Monopolist culture

A situation in which a single company owns all, or nearly every part of the market for a given type of product or service.

Literature Search

The following literature provided the necessary information to complete and enrich the project, also to complete a pilot project that contributed to the wireless application critical trouble report. Although, we know that there is not a perfect model for optimum customer service, a permanent effort for service transformation is needed for success. By reading theses books, we hope to blend our knowledge with the new tools learned in order to help Precise IT Help Desk improve its internal customer service. This means that we will find answers to our six questions, we will be able to define countermeasures for each problem found.

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